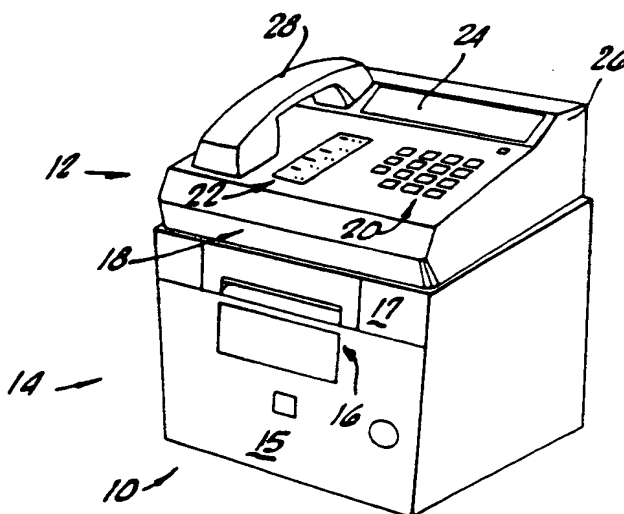


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(54) Title: FINANCIAL DOCUMENT DISPENSING APPARATUS AND METHOD



(57) Abstract

A dispenser (10) produces negotiable money orders, traveler's checks, and the like at remote locations and prints the check amount on the check while also printing summary data of a day's activities on a blank check form, eliminating the need for a separate printer and paper supply. The dispenser (10) prints the check amount using print icons that form a part of each character in the check amount, but are not as large as a complete character or as small as a dot print element. The check forms are connected together by perforation ties, and the dispenser (10) feeds the forms to the printer (14) such that the force with which the dispenser holds the forms is greater than the force needed to tear apart the forms, thus reducing the risk of unauthorized pulling of blank forms from the dispenser (10).

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FINANCIAL DOCUMENT DISPENSING APPARATUS AND METHOD

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BACKGROUND OF THE INVENTION

10 1. Field of the Invention

This invention relates generally to dispensing machines for financial documents and, more particularly, to an apparatus and method for dispensing negotiable money orders and traveler's checks, as well as non-negotiable
15 credit card and debit card receipts, at a plurality of locations.

2. Description of the Related Art

A wide variety of dispensing machines are available for producing financial instruments such as
20 debit card charges, money orders, and traveler's checks. Some machines must be manually operated, and typically include movable printing elements and a printing control arm. When a money order or check is to be printed, for example, a clerk places a blank form in the machine,
25 positions the printing elements according to the requested amount, and actuates the printing control arm. The printing control arm causes the printing elements to be pressed against the blank form, imprinting the requested amount. After the clerk or other authorized person
30 endorses the money order, it is negotiable and can be redeemed by the indicated payee.

Such manually operated machines are very slow, do not provide much security against forgery or unauthorized use, depend on manual entry and reporting, and require the presence of a clerk. Because a clerk is
5 required to operate the manual machine, a remote service location or after-hours service is impossible. Furthermore, transaction records must be manually entered to a data center or directly to the financial institution issuing the check. Accordingly, automatic dispensing
10 machines have been created in which the operator of the machine is the person who wants the completed money order or traveler's check, and in which transaction records are automatically provided to the issuing financial institution. Security against unauthorized use is
15 improved, and transaction records are more easily and accurately maintained.

Automatic dispensing machines are typically computer controlled and are connected to a data center or financial institution by communication lines over which
20 data is sent and received. In operation, a user's identity and bank account information is verified and then the user indicates the requested amount of the money order or traveler's check. After the computer system has verified the user's available funds, the requested amount
25 is printed on a blank, negotiable money order or traveler's check and the completed form is dispensed from the machine. At a predetermined time, typically the end of each business day, the machine prints out a summary of its day's transactions and provides the information to the
30 data center or financial institution.

While such automatic dispensing machines are an improvement on previous manual methods, such machines can be somewhat slow in printing. Often, such machines use printers with standard dot matrix-type print heads that
35 move along the length of the check and imprint the checks

with the check amount in what is commonly referred to as portrait mode. In portrait mode, the print head travels across the check and prints alphanumeric characters that are readable in the direction of print head travel. That is, the characters are printed to be readable along a line that is perpendicular to the direction of paper travel. Ordinarily, the printer receives ASCII-type data designating the characters to be printed and includes the necessary data to activate the proper dot matrix print elements to form the characters and print them along the check and across the direction of paper travel. Thus, for example, the printer simply requires the 8-bit ASCII code for the letter "A" to print an "A" in portrait mode.

Alternatively, the checks can be dispensed lengthwise in what is commonly referred to as landscape mode. In landscape mode, the characters are printed to be readable along a line that is parallel to the direction of paper travel. Print heads must print across the direction of paper travel. Therefore, to print in landscape mode, a printer must perform a conversion routine to essentially rotate the characters relative to the line of printing so they come out on the paper so as to be readable in the direction of paper travel. Printing in landscape mode is not especially quick because of the conversion process and is often much slower than printing in portrait mode.

As an alternative to printing in portrait or landscape mode, the characters can be printed in what is known as graphics mode. In graphics mode, the character information provided to the printer indicates the particular dot matrix print elements that will be activated for printing. This is ordinarily used for printing graphic images from a video screen, for example, and is even slower than landscape mode. Graphics mode does not deal with a regular set of alphanumeric data, where the input for the letter "A" is simply the 8-bit

ASCII code for an "A", but is a lengthy string of bits for activation of the proper individual printing elements. This mode is sometimes used when large, over-sized characters are desired in addition to conventional ASCII character sets. Graphics mode is typically even slower than landscape mode. The data sent to the printer in graphics mode is of relatively low information density when compared to the character-oriented portrait mode. Faster printing times would improve the performance of such automatic dispensing machines.

One of the advantages of automatic dispensing machines is that they automatically keep track of transaction data and periodically print out a summary of the day's transactions to provide a written record. Conventionally, a second printer is provided in the dispenser and prints a transaction summary in portrait mode on a roll of blank paper. Unfortunately, this means the dispensing machine must be loaded with both blank check forms and transaction summary paper. This requires inefficient duplication of printing elements and two kinds of paper supply.

Finally, automatic money order dispensing machines are not immune from tampering. Blank check forms are most conveniently provided as a series of checks separated by perforations and arranged in a fan-fold stack. When an imprinted check is being dispensed from the machine, one end of the check can be grabbed hold of and the stack of checks can be pulled out quickly before the dispenser has stopped the paper advancement. Extra blank check forms can sometimes be retrieved in this way and the blank checks can be filled in with desired amounts and then cashed by unwary clerks. Because the dispensing machines do not require a clerk for operation, such tampering can be carried out without the immediate knowledge of authorized personnel. While missing checks

can be tracked by their serial numbers, the tampering might easily escape detection until the unauthorized checks have been cashed.

From the foregoing discussion, it should be
5 apparent that there is a need for an automatic dispensing machine that can be used at a plurality of separate locations, can quickly and accurately print the necessary data on the face of a blank form, can print transaction summaries, and can do so without inefficient duplication
10 of elements and supplies. The present invention satisfies this need.

SUMMARY OF THE INVENTION

The present invention is embodied in a dispensing machine that can be placed at remote locations
15 and that quickly prints characters on negotiable check draft and non-negotiable charge receipt blank forms and, at the end of a predetermined period of time, prints out machine activity reports on a blank form, eliminating the need for a second printer and paper supply for the
20 reports. Preferably, the drafts and receipts are dispensed lengthwise, and printing is carried out with the draft or charge amount printed along the length of the form in landscape mode and activity reports printed across the form in portrait mode.

25 The blank forms are advantageously provided in a continuous fan-fold stack, individual forms being connected together at their ends by perforation ties that can be pulled apart. In another aspect of the invention, the printer uses a paper feed mechanism in which the force
30 with which the paper is held by the paper feed mechanism during printing and paper advancement with a force that is set to be greater than the force needed to pull apart the forms. Thus, anyone attempting to pull out several blank

forms from the dispensing end during the printing process will only succeed in pulling out a single form, which will not be properly completed or will be completed with only the requested amount. All other blank forms will remain
5 in the printer.

The amount of a check that is to be cashed is preferably printed in oversized characters using print character icons rather than standard alphanumeric characters in landscape mode or oversized characters using
10 dot matrix patterns in graphics mode. The print icons are portions of complete characters, not as small as the individual dot elements of a dot matrix printer such as must be specified in graphics mode or as complete as the alphanumeric characters of an ASCII character set such as
15 must be specified in landscape mode. Rather, a number of the icons can be combined to form the desired complete characters. This allows printing to proceed more quickly than using graphics data or printing characters in landscape mode.

20 The dispensing machine includes a digital processor for processing user commands and controlling machine operation, and comprises a terminal connected to a data center or a financial institution to request account balance inquiries, send activity data, and send
25 and receive various other data and commands. As many dispensing machines can be connected to the data center as can be accommodated by the data center itself. The machine also includes a keyboard for entering input data and a display screen for displaying system messages,
30 entered data, and instructions.

Preferably, the fan-fold check forms are provided with alignment holes at the form ends. The printer checks for the presence of a hole and thereby aligns the forms properly relative to the printing

elements. This is superior to conventional black stripe detectors because more expensive reflective sensors as used with such detectors are not necessary, and instead relatively simple light detectors or mechanical elements can be used. Extra security is also provided because such alignment holes easily provide speed data to the dispenser. If the dispenser becomes aware that paper is travelling at a faster rate than normal, indicating that someone is attempting to pull out blank checks, the dispenser can lock the paper against advancement.

Other features and advantages of the present invention should be apparent from the following description of the preferred embodiment, which illustrates, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an automatic money order/traveler's check dispenser in accordance with the present invention.

FIG. 2 is a block diagram of the dispenser shown in FIG. 1.

FIG. 3 is a partial cut-away view of the printer showing of checks as they are dispensed from the dispenser shown in FIG. 1.

FIG. 4 is a diagram of the letters X, Y, and Z and also the printing icons printed by the print head of the dispenser shown in FIG. 1.

FIG. 5 is the numeral "8" as printed using the print icons shown in FIG. 4.

FIG. 6 is an enlarged and exaggerated representation of two of the printing icons shown in FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 Referring to FIG. 1, an automatic money order/traveler's check dispensing machine 10 constructed in accordance with the present invention includes a communications terminal 12 and a printer unit 14. The communications terminal communicates with a data center or
10 a financial institution to process transaction data generated by operation of the machine. A user enters data, including account identification and the requested check amount, through the communications terminal. After the machine performs user identity and account
15 verification, the printer unit prints the requested check amount onto a blank check form stored within the printer unit and dispenses the completed check lengthwise from a dispensing slot 16. At the end of a predetermined time interval, such as at the end of a business day, the
20 printer unit causes a transaction summary to be printed onto one or more of the blank check forms. Thus, a single printer and paper supply are used for printing both checks and transaction summaries. This reduces the cost of the dispensing machine and also reduces the cost of supplies.

25 The communications terminal 12 includes a keyboard 18 with a numeric keypad 20 and assorted function keys 22 that are used for entering check requests and transaction data. The terminal is provided with a display 24 at which entered data, system commands, and
30 instructions are displayed. Data also can be entered by using a card slot 26, which receives magnetic cards that are encoded with data. Finally, a telephone handset 28 is provided for direct verbal communication with personnel at

the data center. Telephone dialing is accomplished with the keypad 20 or automatically using pre-programmed keys.

5 The printer unit 14 includes a base 15 that receives a plurality of blank forms with pertinent data pre-printed on the forms. A pivotable cover or lid 17 provides access to the interior of the base so that fan-fold stacks of blank forms can be placed in the base. When additional blank forms are to be loaded, the communications terminal 12 can be lifted from where it
10 conveniently rests on the printer unit 14, as illustrated in FIG. 1. After the lid 17 is raised and the blank forms are loaded, the lid can be closed and, if desired, the communications terminal can be placed on the printer unit once again.

15 A better understanding of the dispensing machine operation can be gained by referring to FIG. 2, which is a block diagram that shows the dispensing machine 10 connected to a printer 14 and to a host data center or financial institution 30. Each dispensing machine
20 includes a processor 32 that receives operator input data from the keyboard 18 or card slot 26. The processor communicates with the host computer 30 via a modem 34 and a communications line 36, which allows the dispensing machine to communicate with the host computer to send and
25 receive transaction data, commands, and other necessary information.

The dispensing machine 10 also includes a card reader 38 through which the dispensing machine accepts information encoded on a magnetic card that is passed
30 through the card slot 26 illustrated in FIG. 1. The card reader reads the information that is magnetically encoded on the card, such as identification data and card expiration status. The card reader can be used, for example, to charge a user's credit card or debit card for

the amount of dispensed checks. Thus, a user can obtain traveler's checks in amounts greater than the user's cash-on-hand. If the user requests checks in an amount greater than the user's credit limit, the dispensing machine halts processing and indicates an error on the display 24. The dispenser 10 further includes a memory unit 40 that stores transaction data, acceptable security codes, and other data necessary for operation of the system.

The printer 14 is connected to the dispenser by a printer cable 42. The processor 32 organizes the data to be printed into the proper format, whether it is check amount data or transaction summary data. As noted, the check amount is printed using icons. The processor accepts the check amount indicated from the keyboard 18, formats it into the proper representation, and provides it to the printer 14 via the printer cable 42. The processor 32 also performs various administrative functions, such as beginning operation by accepting security code data from authorized personnel, verifying user identification, and controlling the periodic summary transaction reports delivered to the host computer.

A completed check 50 is shown being dispensed from the printer 14 in FIG. 3. The check is a multiple-part form comprising an original top layer 52 and a duplicate non-negotiable form 54 backing layer that is retained as a receipt by the customer. Preferably, a carbonless paper multiple-part form is used, eliminating the need to dispose of waste carbon layers and reducing the chances of copies being smudged. The check forms are provided in a continuous fan-fold stack in which individual forms 50 and 51 are connected by perforation ties 56. Strips of paper 57 with sprocket-receiving holes are attached by perforations to the top and bottom edges of the check forms. A tractor feed mechanism, known to those skilled in the art, is used to advance the forms

through the printer, but other printer mechanisms, such as friction feed, can also be used.

As noted above, using blank check forms to print both completed checks and transaction summaries reduces the cost of the apparatus 10 and the cost of supplies. Using multiple-part forms, such as illustrated in FIG. 3, further provides transaction summaries that are easier to read. Generally, the top layer 52 of a multiple-part form includes identifying marks, patterns, watermarks, printed information, and the like that are absent from the backing layer 54, which can comprise a blank sheet. The contrast between the printed characters and the paper is thereby improved. Thus, characters that are impressed from the printer 14 onto the backing layer generally can be more easily read than characters that are printed on the top layer. Thus, the backing layers of multiple-part forms provide an easily read copy of the transaction summaries.

FIG. 3 shows that the check amount is printed lengthwise along the check, parallel to the top edge 58 and bottom edge 60 of the check. Printing is performed by a dot matrix print head 62 having a plurality of printing elements extending across the check. The print head 62 comprises a single row of four printing elements, or pins, providing a resolution of, for example, 64 dots per inch (DPI). It should be understood that other print head configurations can also be used. The print head 62 is supported above a blank check form 51 by two rails 63, along which the print head is swept back and forth across the check while the printing elements are selectively activated. In this way, dots that form characters and images can be printed on the check.

As noted, the printer 14 can include either a conventional friction feed or tractor feed mechanism advancing the check forms past the print head 62. In

either case, the forms 51 are held as they are advanced with a force that is greater than the force needed to break the perforation ties 56. In this way, anyone attempting to pull extra blank forms out of the printer 14 when a check is being printed will only succeed in pulling out the single completed check 50, and the remaining blank checks will stay in the printer.

Because checks are removed from the printer unit 14 as they come out of the slot 16, the forward edge 64 of a check 50 is the first edge to leave the printer. The rear edge 66 of the check is adjacent with the next appearing blank check form 51. One end of the check is provided with an alignment hole, such as the hole 68 shown near the rear edge 66. The alignment hole is used by a sensor 70 to detect the end of a check form and monitor both the registration of the check relative to the print head 62 and the paper speed of the checks being printed. A forward alignment hole 69 can be provided alternatively or additionally to check for the forward edge of the forms. In this way, printing can begin with the very first form in the stack.

The sensor 70 is preferably a simple optical sensor that receives light from a light source (not illustrated) when an alignment hole 68 or 69 is positioned between the light source and the sensor. When the sensor detects an alignment hole, it provides a signal to the processor 32, which causes feeding of check forms to stop in a position that gives proper registration to the forms relative to the print head 62 so that printing will occur on the proper blank lines of the check 51. The sensor 70 is also used to prevent tampering. Depending on the number of checks requested, printing can proceed at up to approximately eight checks per minute. The sensor 70 provides a signal to the processor as each check is printed, and therefore the processor can quickly determine

if a check has passed by faster than possible by printing with the print head 62. This indicates tampering, and the processor responds to such an indication by locking the feed mechanism with a pair of solenoids 72.

5 FIG. 4 illustrates the sixteen character icons 102-132 used in printing the checks 50, preceded by three alphanumeric characters X, Y, and Z, printed in portrait mode by the printer unit 14. FIG. 5 shows the numeral 8,
10 printed using the icons. The icons are created by providing the printer with data that will form the desired icons. Conventional print head assemblies include memory for the storage of data that will form standard characters. The icon data is stored in one of two ways, depending on the capabilities of the printer unit 14.

15 Many printers are capable of supporting only a standard ASCII character set, which consists of approximately 128 characters. Many of these characters are seldom used. If the printer unit 14 has only such
20 128-character capability, then the icons are created by replacing the character data corresponding to some of the ASCII-standard but seldom-used alphanumeric characters with icon data. More specifically, standard software code supplied with a commercially available dot matrix printer assembly includes stored data that causes the printing of
25 the particular dot pattern associated with each character of a standard ASCII alphanumeric character set. The icon character set of the preferred embodiment includes sixteen icons. Therefore, in accordance with the present invention, the data for sixteen of the ASCII characters is
30 replaced with the data for the sixteen icons 102-132. When the printer unit 14 is instructed by the processor 32 (FIG. 2) to print one of the sixteen replaced characters, an appropriate icon is printed instead. In this way, the printer unit operates as it otherwise would when printing

a standard alphanumeric character in portrait mode, but instead prints an icon.

For example, the character "&" is not ordinarily used in printing machine activity data. Therefore, the stored data ordinarily used by the printer 14 for generating the "&" character is replaced with the data for one of the icons 102-132 and the printer is instructed to print that character when the icon is desired. The icons can be used to print characters that are oriented as if printed in the landscape mode, so they can be read lengthwise along the check, even though the printing is actually carried out in portrait mode. By organizing the print data in this way, the printing of checks can proceed faster than if alphanumeric data were sent to the printer for printing or if graphic data were provided to the printer for printing in graphics mode.

Some of the more advanced printer assemblies available are capable of supporting a 256-character alphanumeric set. Such a printer therefore supports approximately 128 characters in addition to the standard 128 ASCII characters. If the printer unit 14 has a 256-character capability, then the icon data can be stored in the printer memory for the unused 128 non-ASCII characters. Regardless of the printer capability, those skilled in the art will recognize that a great number of icons can be supported by printer units of either capability described above. In the preferred embodiment, however, only sixteen icons are necessary.

FIG. 6 illustrates two of the print icons 102 and 104 shown in FIG. 4, but in greater detail and with the distance between the dots made by the printing elements exaggerated for clarity. The maximum allowable print area is seven dots high by eight dots wide. Because the print head 62 (FIG. 3) includes eight printing

elements, the icons 102-132 are created in up to two passes of the print head, as are conventional alphanumeric characters in portrait mode. Forming the desired alphanumeric characters, oriented as if printed in landscape mode, is simply a matter of providing the printer with instructions to print the proper sequence of standard portrait mode keyboard characters whose print data have been replaced with the icon print data. Thus, although from the printer's perspective the printing is being done in portrait mode, the characters actually come out in landscape orientation. Because the portrait mode is used, printing proceeds more quickly than if graphics mode was used. When activity data is printed, the data is printed using the standard ASCII input characters in portrait mode, which are smaller in size and require only one pass of the print head 62 to print. The check amount characters, such as shown in FIG. 5, can require up to five passes of the print head. In this way, a greater amount of activity information can be printed than if the information were printed lengthwise with larger characters.

Those skilled in the art will appreciate that the dispenser 10 can be used for producing debit charge and credit card receipts in addition to producing negotiable financial instruments such as money orders and traveler's checks. The blank forms used by the dispenser would likely be changed to print credit card receipts, but the structural details of the dispenser would remain the same and the advantages discussed above would be obtained.

An automatic negotiable draft and non-negotiable receipt dispenser in accordance with the present invention provides a terminal that communicates with a data center or financial institution and a printer that prints out completed drafts and receipts on blank forms using print icons that create alphanumeric characters lengthwise along

the forms and that also prints out transaction summary reports in portrait mode on blank forms. The forms used to print out the transaction summary reports are voided. Using the same printer and the same paper supply to print
5 out completed drafts or receipts and transaction summary reports reduces the number of elements needed for the printer and reduces the supply costs. A processor contained within the terminal advantageously tends to switching between completed-form printing and transaction
10 summary printing modes.

Appendix A is the assembly code listing for the data needed to generate the print icons 102-132 shown in FIG. 4. Large-size and medium-size numerals are provided by the code. The reference to landscape mode refers to
15 the orientation of the printed characters and not to the printing mode. The characters are printed with the printer unit 14 in portrait mode.

The present invention has been described above in terms of presently preferred embodiments so that an
20 understanding of the present invention can be conveyed. There are, however, many configurations for dispensing machines not specifically described herein, but with which the present invention is applicable. The present invention should therefore not be seen as limited to the
25 particular embodiments described herein, but rather it should be understood that the present invention has wide applicability with respect to dispensing machines. Such other configurations can be achieved by those skilled in the art in view of the description herein.

APPENDIX A

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5 ; string of characters to form
; large zero in landscape mode

LANDOL: DB 88H ;column 1

DB 89H

DB 89H

10 DB 89H

DB 89H

DB 8EH

DB 87H ;column 2

DB FC

15 DB FC

DB FC

DB 80H

DB 86H ;column 3

DB 85H

20 DB 85H

DB 85H

DB 84H

DB 'zero ' ;column 4

DB ENDDDEL ;end delimiter

25 -----

;string of characters to form

;large one in landscape mode

LAND1L:

```

        DB      8CH          ;column 1
        DB      85H
        DB      85H
5       DB      85H
        DB      8BH
        DB      8AH
        DB      20H          ;column 2
        DB      20H
10      DB      20H
        DB      20H
        DB      20H
        DB      87H          ;column 3
        DB      20H
15      DB      20H
        DB      20H
        DB      20H
        DB      'one '      ;column 4
        DB      ENDDDEL      ;end delimiter
20      ; - - - - - E N D
ONE-----
        ;string of characters to form
        ;large two in landscape mode

```

LAND2L: DB 8FH ;column 1

```

25      DB      89H
        DB      8EH
        DB      20H
        DB      8EH
        DB      87H          ;column 2
30      DB      20H
        DB      80H
        DB      20H

```

```

        DB      80H

        DB      87H          ;column 3
        DB      20H
        DB      80H
5       DB      85H
        DB      84H

        DB      'two '      ;column 4
        DB      ENDEL       ;end delimiter

; ----- E N D
10    TWO-----
        ;string of characters to form
        ;large three in landscape mode

        LAND3L:  DB      88H          ;column 1
                DB      20H
15       DB      20H
                DB      8EH

                DB      87H          ;column 2
                DB      20H
20       DB      FCH
                DB      20H
                DB      80H

                DB      86H          ;column 3
                DB      85H
25       DB      FB4
                DB      85H
                DB      84H

        DB      'three'      ;column 4
        DB      ENDEL       ;end delimiter
```

-20-

; - - - - - E N D
THREE-----

;string of characters to form
;large four in landscape mode

5 LAND4L: DB 20H ;column 1
DB 80H
DB 83H
DB 82H
DB 20H

10 DB 20H ;column 2
DB 80H
DB 20H
DB 81H
DB 82H

15 DB 94H ;column 3
DB 94H
DB 89H
DB 89H
DB 89H

20 DB 'four ' ;column 4
DB ENDDel ;end delimiter

; - - - - - E N D
FOUR-----

;string of characters to form
25 ;large five in landscape mode

LAND5L: DB 88H ;column 1
DB 20H
DB 80H
DB 89H
30 DB 9AH

-21-

```

      DB      87H          ;column 2
      DB      20H
      DB      80H
      DB      20H
5      DB      80H

      DB      86H          ;column 3
      DB      85H
      DB      84H
      DB      20H
10     DB      80H

      DB      'five '      'column 4
      DB      ENDDDEL      'end delimiter

; - - - - - E N D
FIVE-----
15      ;string of characters to form
      ;large six in landscape mode
-----
LAND6L: DB      88H          ;column 1
      DB      89H
      DB      9AH
20     DB      89H
      DB      8EH

      DB      87H          'column 2
      DB      20H
      DB      80H
25     DB      20H
      DB      80H

      DB      86H          ;column 3
      DB      85H
      DB      84H
30     DB      20H
      DB      84H
```

-22-

```

DB  'six  '      ;column 4
DB  ENDDDEL      ;end delimiter

```

```

; - - - - - E N D
SIX-----

```

```

5      ;string of characters to form
      ;large seven in landscape mode

```

```

LAND7L: DB  20H      ;column 1
        DB  20H
        DB  20H
10      DB  20H
        DB  80H

```

```

        DB  89H      ;column 2
        DB  82H
        DB  20H
15      DB  20H
        DB  80H
        DB  20H      ;column 3
        DB  20H
        DB  82H

```

```

20      DB  85H
        DB  84H

```

```

DB  'seven'      ;column 4
DB  ENDDDEL      'end delimiter

```

```

; - - - - - E N D
25 SEVEN-----

```

```

      ;string of characters to form
      ;large eight in landscape mode

```

```

LAND8L: DB  88H      ;column 1
        DB  89H
30      DB  9AH
        DB  89H

```


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```

        DB      8EH

        DB      87H      ;column 2
        DB      20H
        DB      80H
5       DB      20H
        DB      80H

        DB      86H      ;column 3
        DB      85H
        DB      9BH
10      DB      85H
        DB      84H

        DB      'eight'   ;column 4
        DB      ENDDDEL   ;end delimiter

; - - - - - E N D
15 EIGHT-----
      ;string of characters to form
      ;large nine in landscape mode

LAND9L: DB      88H      ;column 1
        DB      20H
20      DB      88H
        DB      89H
        DB      8EH

        DB      87H      ;column 2
        DB      20H
25      DB      87H
        DB      20H
        DB      80H

        DB      86H      ;column 3
        DB      85H
30      DB      8CH
```

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```

        DB      85H
        DB      84H

        DB      'nine '      ;column 4
        DB      ENDDDEL      ;end delimiter

5      ; - - - - - E N D
NINE-----
        ;string of characters to form
        ;medium zero in landscape mode

LANDOM:  DB      88H      ;column 1
10      DB      89H
        DB      8EH

        DB      86H      ;column 2
        DB      85H
        DB      84H
15      DB      ENDDDEL      ;end delimiter

; - - - - - E N D      M
ZERO-----
        ;string of characters to form
        ;medium one in landscape mode

20      LAND1M:  DB      85H      ;column 1
        DB      85H
        DB      8BH

        DB      20H      ;column 2
        DB      20H
25      DB      20H
        DB      ENDDDEL      ;end delimiter

; - - - - - E N D      M
ONE-----
        ;string of characters to form

```

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;medium two in landscape mode

LAND2M: DB 8FH ;column 1
DB 87H
DB 8EH

5 DB 87H ;column 2
DB 86H
DB 84H
DB ENDDDEL ;end delimiter

; - - - - - E N D M
10 TWO-----

;string of characters to form
;medium three in landscape mode

LAND3M: DB 88H ;column 1
DB 20H
15 DB 80H

DB 86H ;column 2
DB 84H
DB 81H
DB ENDDDEL ;end delimiter

20 ; - - - - - E N D M
THREE-----

;string of characters to form
;medium four in landscape mode

LAND4M: DB 20H ;column 1
25 DB 8AH
DB 20H

DB 85H ;column 2
DB 9CH
DB 8BH

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```

        DB      ENDDEL          ;end delimiter

; - - - - - E N D      M
FOUR-----
        ;string of characters to form
5          ;medium five in landscape mode

LAND5M:  DB      88H          ;column 1
        DB      80H
        DB      9AH

        DB      86H          ;column 2
10       DB      84H
        DB      80H
        DB      ENDDEL        ;end delimiter

; - - - - - E N D      M
FIVE-----
15       ;string of characters to form
        ;medium six in landscape mode

LAND6M:  DB      88H          ;column 1
        DB      9AH
        DB      8EH

        DB      86H          ;column 2
20       DB      84H
        DB      84H
        DB      ENDDEL        ;end delimiter

; - - - - - E N D      M
25       SIX-----
        ;string of characters to form
        ;medium seven in landscape mode

LAND7M:  DB      20H          ;column 1
        DB      20H
```

```

        DB      80H

        DB      89H          ;column 2
        DB      89H
        DB      81H
5        DB      ENDDDEL          ;end delimiter

; - - - - - E N D M
SEVEN-----
        ;string of characters to form
        ;medium eight in landscape mode

10    LAND8M:    DB      88H          ;column 1
        DB      9AH
        DB      8EH

        DB      86H          ;column 2
        DB      9BH

15    DB      84H
        DB      ENDDDEL          ;end delimiter

; - - - - - E N D M
EIGHT-----
        ;string of characters to form
        ;medium nine in landscape mode

20    LAND9M:    DB      88H          ;column 1
        DB      80H
        DB      8EH

        DB      86H          ;column 2
25    DB      9BH
        DB      84H
        DB      ENDDDEL          ;end delimiter

```

I claim:

1. A dispenser for producing negotiable checks and the like from blank forms at a remote location, comprising:

5 processing means for controlling the operation of the dispenser and for communicating with a data center;

a keyboard, connected to the processing means, that is used by a dispenser operator to provide transaction data, including a requested check amount, to
10 the processing means;

display means for displaying the transaction data entered at the keyboard;

memory means for storing the transaction data entered at the keyboard and for storing operations
15 carried out by the processing means;

a plurality of blank forms that are stored in the dispenser;

printing means for printing the requested check amount on a blank form and for printing an activity
20 summary of the transaction data, check amounts, commands, and operations stored in the memory means during a predetermined time interval on a blank form; and

communication means for sending a summary of the transaction data and operations stored in the
25 memory means during a predetermined time interval to the data center.

2. A dispenser as defined in claim 1, wherein the printing means prints the check amount lengthwise along the blank form and prints the activity summary across the blank form from top edge to bottom edge.

3. A dispenser as defined in claim 2, wherein the printing means prints the check amount using print

icons that individually form a part of characters in the check amount.

4. A dispenser as defined in claim 1, wherein the blank forms comprise individual forms connected together by perforation ties between forms in a fan-fold arrangement;

5 and wherein the dispenser includes feed means for holding the forms while feeding them to the printing means such that the force with which the feed means holds the forms is greater than the force required to break the perforation ties between forms.

5. A dispenser as defined in claim 1, wherein the blank forms comprise individual forms connected together in a fan-fold arrangement with at least one alignment hole located near one end of each form;

5 wherein the dispenser includes feed means for holding the forms while feeding them to the printing means;

10 and wherein the dispenser further includes sensor means for sensing the presence of an alignment hole and causing the feed means to stop the feeding of the forms at the proper registration relative to the printing means for proper printing of the check amount and for sensing when the alignment holes are moving faster than normal, and for responding to faster than normal movement
15 by stopping the feeding of the blank forms.

6. A dispenser as defined in claim 1, wherein the dispenser includes a telephone handset that provides verbal communication with the data center.

7. A dispenser as defined in claim 1, wherein the dispenser further includes a magnetic card reader that accepts magnetically encoded cards and reads the encoded information thereon.

8. A dispenser for producing negotiable checks and the like at a remote location, comprising:

keyboard means, having a plurality of data entry keys, for producing transaction data and operating
5 commands in response to operator input commands entered via the data entry keys;

a display that displays the data and commands entered at the keyboard means;

memory means for storing the transaction
10 data and commands entered at the keyboard means and for storing operations carried out by the dispenser;

a plurality of check forms stored in the dispenser;

printing means for printing a blank check
15 with a check amount derived from the transaction data and for printing a blank check with an activity summary of the transaction data, commands, and operations that are stored in the memory means during a predetermined time interval;
and

20 control means for controlling the operation of the dispenser and for communicating with a remote data center to periodically send the activity summary of the check amounts, transaction data, commands, and operations stored in the memory means during a predetermined time
25 interval;

wherein the printing means prints the check amount lengthwise along the check using print icons that individually form a part of each character of the transaction data and together form the characters making
30 up the check amount.

9. A dispenser as defined in claim 8, wherein the printing means is capable of printing in portrait mode and in landscape mode, and prints both the print icons and activity summary in portrait mode.

10. A dispenser as defined in claim 9, wherein the print code for predetermined standard portrait mode characters is replaced with the print code for the print icons.

11. A dispenser as defined in claim 8, wherein the check forms comprise individual forms connected together by perforation ties between forms in a fan-fold arrangement; and

5 wherein the dispenser includes feed means for holding the forms and feeding them to the printing means such that the force with which the feed means holds the forms is less than the force required to break the perforations between forms.

12. A method for printing check amounts onto blank checks to be dispensed from a dispensing machine having a printer, comprising the steps of:

 accepting a requested check amount from a
5 machine operator;
 generating alphanumeric characters corresponding to the requested check amount;
 generating icon print data for icons corresponding to the alphanumeric characters;
10 providing the icon print data to the printer; and
 imprinting blank checks with the requested check amounts.

13. A method for printing checks as defined in claim 12, further comprising the steps of:

 storing transaction data including requested check amounts during a predetermined interval of
5 time;

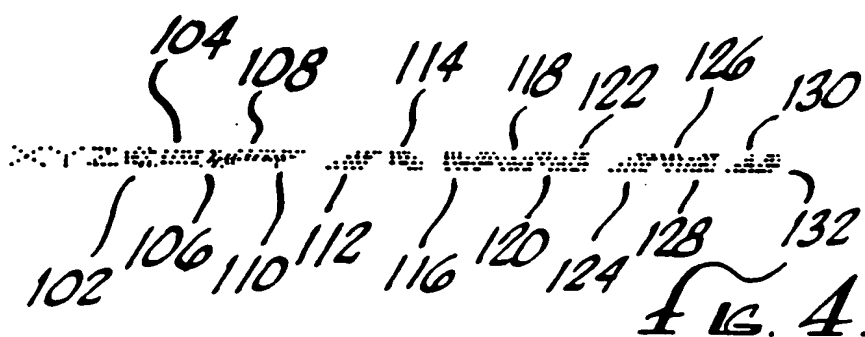
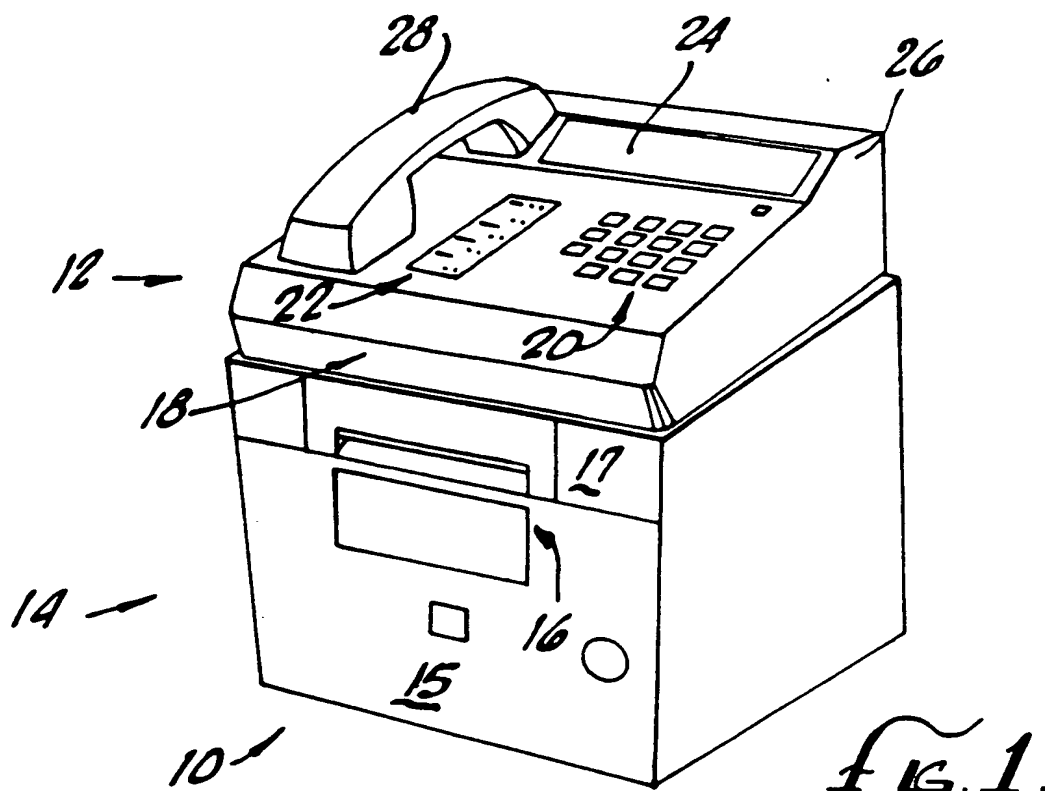
 periodically providing the transaction data to the printer; and

printing the transaction data on blank checks.

14. A method for printing checks as defined in claim 12, wherein the step of accepting a requested check amount includes the steps of:

- 5 accepting a magnetically encoded card and reading the encoded information to determine a user's available charge or debit amount; and

 indicating an error condition if the requested check amount is greater than the available charge or debit amount.



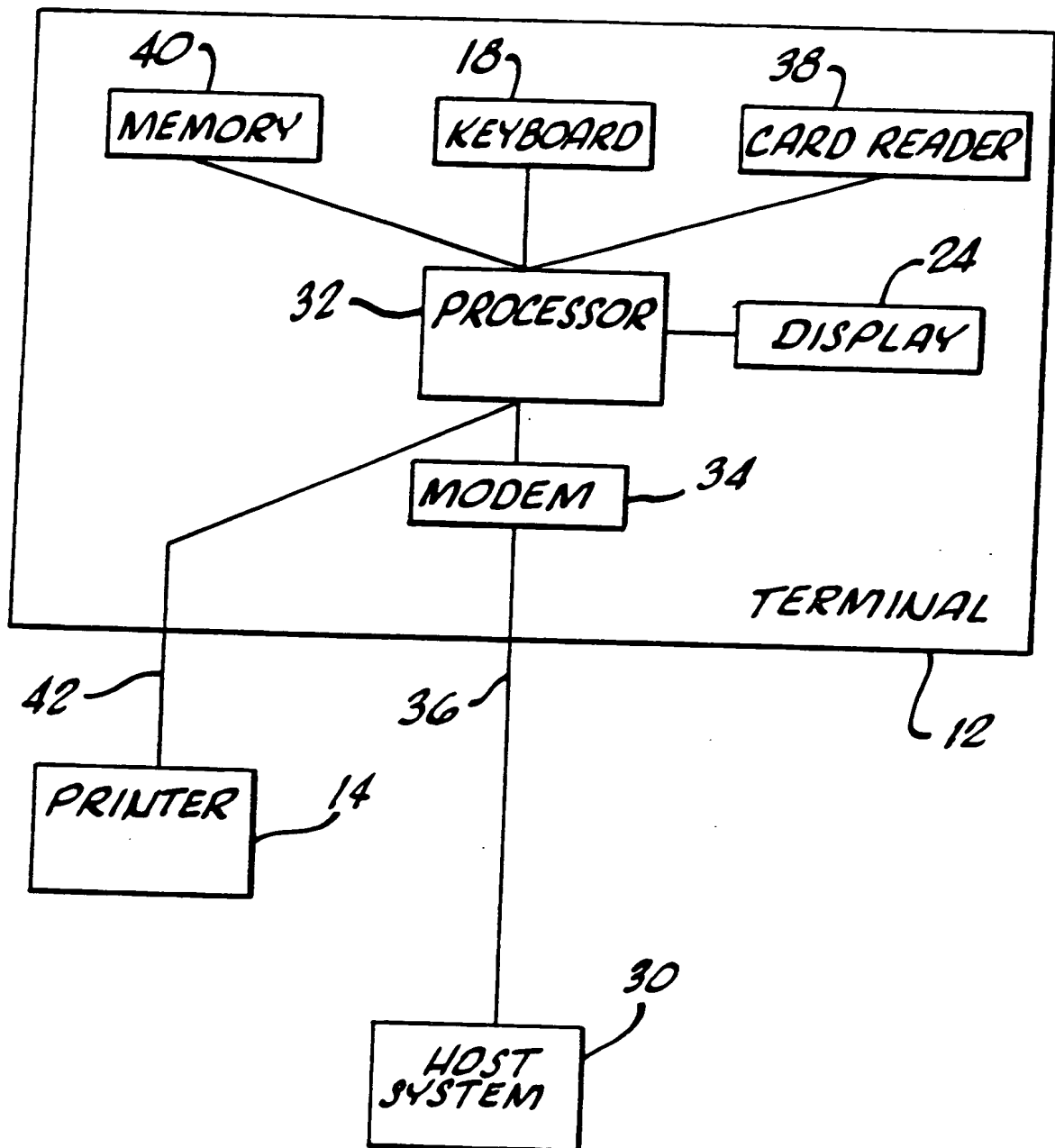


FIG. 2.

FIG. 3.

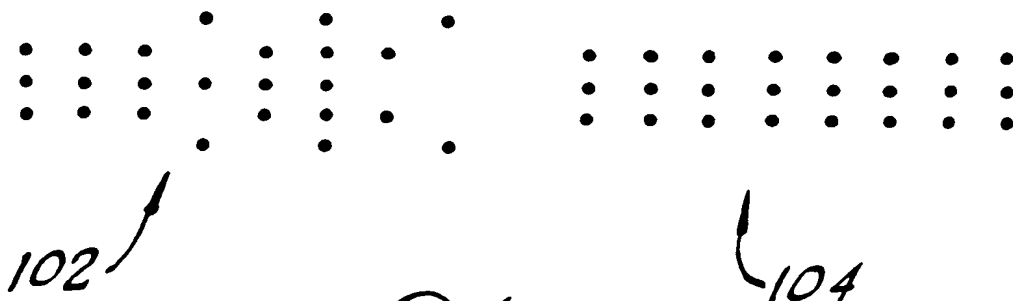
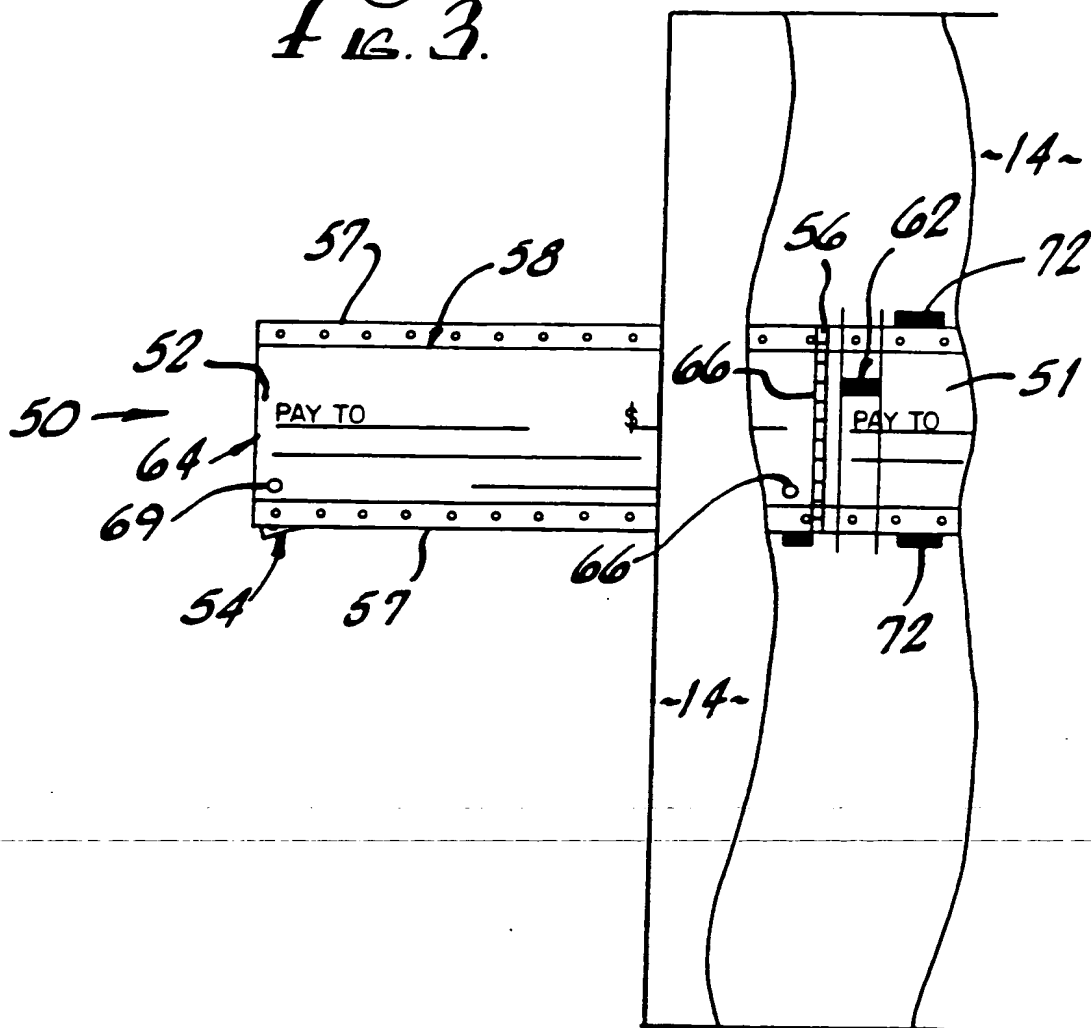


FIG. 6.

INTERNATIONAL SEARCH REPORT

PCT/US92/09333

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : G06F 15/00

US CL : 235/381, 235/379

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 235/381, 235/379; 235/380, 381; 364/479, 468

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,970,655 (WINN ET AL.) 13 November 1990. See the entire document.	1-14

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	* T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A document defining the general state of the art which is not considered to be part of particular relevance	* X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
* E earlier document published on or after the international filing date	* Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
* L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	* & document member of the same patent family
* O document referring to an oral disclosure, use, exhibition or other means	
* P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

09 JANUARY 1993

Date of mailing of the international search report

22 JAN 1993

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